

Proposal Reviews

#241: Monitoring and Assessment of Native and Non-native Resident Stream Fishes in the Sacramento-San Joaquin Watershed

US Geological Survey

Initial Selection Panel Review

Research and Restoration Technical Panel Review

Delta Regional Review

San Joaquin Regional Review

Sacramento Regional Review

#1

External Scientific Review

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Environmental Compliance

Budget

Initial Selection Panel Review:

CALFED Bay-Delta 2002 ERP PSP Initial Selection Panel Review

Proposal Number: 241

Applicant Organization: US Geological Survey

Proposal Title: Monitoring and Assessment of Native and Non-native Resident Stream Fishes in the Sacramento-San Joaquin Watershed

Please provide an overall evaluation rating.

Explanation of Recommendation Categories: Fund

- **As Is** (a proposal recommended for funding as proposed)
- **In Part** (a proposal for which partial funding is recommended for selected project phases or components)
- **With Conditions** (a proposal for which funds are recommended if the applicant contractually agrees to meet the specified conditions)

Consider as Directed Action in Annual Workplan (a proposal addressing a high priority action that requires some revision followed by additional review prior to being recommended for funding)

Not Recommended (a proposal not currently recommended for funding-after revision may be considered in the future)

Note on "Amount":

For proposals recommended as Fund As Is, Fund In Part or Fund With Conditions, the dollar amount is the amount recommended by the Selection Panel.

For proposals recommended as Consider as Directed Action in Annual Workplan, the dollar amount is the amount requested by the applicant(s).

Fund	
As Is	-
In Part	-
With Conditions	-
Consider as Directed Action	-
Not Recommended	X

Amount: **\$0**

Conditions, if any, of approval (if there are no conditions, please put "None"):

None.

Provide a brief explanation of your rating:

The Technical Panel rating of "Above Average" refers to a revised proposal and not the proposal now before the Selection Panel. The rating assumed CALFED improved the proposal by changing coordination and reducing scope and costs. Consideration in the next PSP round is encouraged if several technical problems can be resolved. The proposal helps with strategic goals and Implementation Plan priorities, but shortcomings include lack of strong fish-habitat relationships or the associated variability from the proposed sampling. Eco benefits and info value for the ERP are weak for the same reasons, although new knowledge may be acquired on the presence/absence of stream fishes. Regional panels did not favor the proposal with two "low" and one "medium" rating. The first external science review rated the proposal "excellent." The second external review awards a good and suggests revising the scope and costs and providing more thought and development on determining robustness of the various methods. The third external review gives it a poor for inadequate sampling design and costs several times greater than warranted. Concerns over application to the ERP also weighed in favor of the do-not-fund recommendation.

Research and Restoration Technical Panel Review:

CALFED Bay-Delta 2002 ERP PSP Research and Restoration Technical Panel Review Form

Proposal Number: 241

Applicant Organization: US Geological Survey

Proposal Title: Monitoring and Assessment of Native and Non-native Resident Stream Fishes in the Sacramento-San Joaquin Watershed

Review:

Please provide an overall evaluation summary rating:

Superior: outstanding in all respects;

Above Average: Quality proposal, medium or high regional value, and no significant administrative concerns;

Adequate: No serious deficiencies, no significant regional impediments, and no significant administrative concerns;

Not Recommended: Serious deficiencies, significant regional impediments or significant administrative concerns.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Superior	The technical values judged by outside reviewers gave this project a high overall rating and recognized the need for this kind of work. The regional reviews pointed out strong weaknesses and/or concerns dealing with lack of coordination with the many projects at the possible sites. The Panel supports the regional review concerns and feels coordination must precede field work. Scientific reviewers noted that the project has potential to make a substantial contribution to the larger goals of CalFed and could have later importance in evaluating other than anadromous fish responses to restoration. There needs to be modification of the objectives, some of which need no further work or are trivial. The most serious concern has to do with the excessive cost for sampling this many sites. The Panel feels the budget for this project should be half or less than that proposed for scale of this project. The final rating is based on the assumption that coordination and a reduced cost will be accomplished. However, one of the panelists rates the project only ADEQUATE even with the recommendations.
XAbove average	
-Adequate	
-Not recommended	

1. **Goals and Justification.** Does the proposal present a clear statement of goals, objectives and hypotheses? Does the proposal present a clear justification and conceptual model for the project?

There is clear connection between goals and justification with good understanding of background research. Use of IBI is increasingly important and relevance to resident fish is excellent. There is a weakness in assuming spring flows are the major determinants of community structure or that they are separable from other factors (in this project). Some of

the objectives are already well known and need little further demonstration. The basis for a second year of resampling is of questionable value for the cost.

2. **Likelihood of Success (Approach, Feasibility, Capabilities and Performance Measures).** Is the project likely to succeed based on the approach, feasibility and project team capabilities? Are the proposed performance measures adequate for measuring the project's success?

The approach needs some additional description of how data from different methods will be integrated and tested for repeatability. A second year of data will provide weak strength for testing relationships of flow both because of other confounding factors in the streams and because of the assumption of immediate fish population response. The proposal has not laid a good foundation for how the methods used will be judged as standard protocols.

Reviewers and CalFed must rely on the process that if the project were able to use the selected methods and found associations among the variables, then the protocol can be considered standard. Alternatively, if this is a serious attempt to develop standard protocols, then effort should be devoted, for example, to comparisons between the teams on their ability to achieve similar results on the same streams, or determination of the required sample size to achieve precise IBI values. More thought and development is required of how the project would demonstrate the robustness of the various methods.

Reviewers suggest a number of ways the proposal could be restructured to improve results and make more efficient use of resources and time. The team involved has demonstrated capacity to execute such extensive studies and collaboration among agency and academic scientists is a plus.

3. **Outcomes and Products.** Will the project advance the state of scientific knowledge in general and/or make an important contribution to the state of knowledge of the Bay-Delta Watershed? For restoration proposals, is the project likely to contribute to ecosystem restoration or species recoveries in a significant way? Will the project produce products useful to decision-makers and scientists?

There will likely be some contribution of hypotheses about natural vs. human-induced factors among the streams and to understanding conditions and relationships among resident species. A baseline of information about resident species and their future use in measuring restoration efforts is important.

4. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

The cost is very high considering that only 70 sites will be sampled once per year. Weakness in the description of analysis and validation make full benefits unknown. There may be little benefit relative to cost for the planned second year of work. A scaled back second year or restructuring of objectives would improve prospects.

5. **Regional Review.** How did the regional panel(s) rank the proposal (High, Medium, Low)? Did the regional panel(s) identify significant benefits (regional priorities, linkages with other activities, local involvement) or impediments (local constraints, conflicts with other activities, lack of local involvement) to this proposal? What were they?

Regional reviews of three regions were MEDIUM, LOW, and LOW. The major concern was a two year period to make substantive conclusions about the relationships to flow or variation. There was also concern that the suite of sites include those with ongoing activities but little coordination with such groups was in evidence. Potential conflicts or time needed to establish

coordination weakens the rating. The strength of the project is developing basic information on resident fish (including non-native interactions) that could be of useful over time in monitoring restoration.

6. **Administrative Review.** Were there significant concerns about the proposal with regard to the prior performance, environmental compliance and budget administrative reviews? What were they?

There was no evidence that the cost for environmental compliance (permits) was budgeted. The budget did not identify overhead rate differences between USGS and CSUC and there were other budget inconsistencies on State/Federal shares that must be resolved.

Miscellaneous comments:

Reviewers made thoughtful suggestions for improving this potentially important contribution to knowledge that could be used if funded or used to improve a subsequent proposal.

Delta Regional Review:

Proposal Number: 241

Proposal Title: Monitoring and Assessment of Native and Non-native Resident Stream Fishes in the Sacramento-San Joaquin Watershed

Overall Ranking: -Low **XMedium** -High

Provide a brief summary explanation of the committee's ranking:

This study appears feasible but did not achieve a high rating because of uncertainties about the sampling frequency and the applicability of data with such a low sample size.

1. Is the project feasible based on local constraints?

XYes -No

How?

Applicants have shown to be very capable of the task, with considerable relevant and timely publications. The investigators will be required to obtain a Section 7 ESA take permit which requires a lengthy consultation process, however, they have incorporated ample time for this process. This Valley-wide study will also require local agency and property owner approval to enter land which can be acquired during consultation. Study design and statistical approach appears feasible.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

XYes -No

How?

Ecosystem Restoration Program Strategic Goals This work, which strives to utilize an index of biological integrity (IBI) to assess the aquatic condition has far-reaching effects, helping achieve recovery of at risk species (Goal 1), the rehabilitation of aquatic communities (Goal 2), and the protection and restoration of habitats (Goal 4). In addition, this study would further our understanding of non-native species interactions and habitat use/requirements (Goal 5).

CALFED Science goals This study addresses a host of CALFED Science program goals including the development of performance measures, the understanding of CALFED program actions, and the coordination of existing monitoring.

Regional Implementation Priorities Multi-Region. This study will help prevent the complete inundation of non-native species and relates to MR-1. MR-6 ensures recovery of at-risk-species by using conceptual models that cross multiple regions. This effort would assist in this regard.

CVPIA Priorities CVPIA section 3402(a) protects, restores, and enhances fish and wildlife in the Central Valley. This study will bring critical data to the protection and restoration process of native fish including the anadromous fishes such as salmon and steelhead (high CVPIA priority). Also relates to 3406(b)(1) which authorizes the AFRP to make all reasonable efforts to double anadromous fish by 2002.

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

XYes -No

How?

This project is linked with many other aquatic habitat related studies in streams and rivers of the Central Valley. The information acquired from this study will be used to guide and verify past and future restoration efforts. If the IBI index works, it will be useful for restoration assessment.

4. Does the project adequately involve local people and institutions?

XYes -No

How?

The primary investigator of the project has been integrally involved with the Interagency Ecological Study Program (IEP) for numerous years gaining access to a vast array of science expertise for review and feedback purposes. Secondary investigator Marchetti is an assistant professor at Chico State University.

The investigators will continue to maintain contact with organized watershed groups and interagency groups that are interested but have not mad formal contact yet.

Other Comments:

A general caution to authors and the amount of data generated and stored a relational database would be more efficient and useable than Excel spreadsheets, especially with large data sets.

Very few references to quality control and quality assurance processes.

A considerable amount of effort will need to be expended to determine sampling sites, many of which may have changed significantly from year to year. How are these sites selected?

I appreciated the effort informing the reviewers of statistical approaches and data analysis. This was helpful. Excellent proposal.

Be sure to coordinate monitoring with IEP and watershed efforts speared by FWS, USBR, CDFG, and various government and non-government biologists.

San Joaquin Regional Review:

Proposal Number: 241

Applicant Organization: US Geological Survey

Proposal Title: Monitoring and Assessment of Native and Non-native Resident Stream Fishes in the Sacramento-San Joaquin Watershed

Overall Ranking: ☒Low ☐Medium ☐High

Provide a brief summary explanation of the committee's ranking:

The committee ranked this proposal as having a low priority for the San Joaquin region. The committee was concerned that the study window was too short to gather enough data to make conclusions about water quality and flow regimes in a given watershed section as well as the potential problems with obtaining permits from the necessary agencies.

1. Is the project feasible based on local constraints?

☒Yes -No

How?

Applicant has the technical expertise to carry out the proposal. Applicant has not secured access permission at all anticipated sampling sites- may be a variable problem depending on which watershed are sampled. Applicants have not obtained permits from NMFS/USFWS/CDFG for incidental take of listed species during sampling (particularly for electrofishing). Electrofishing may not be a feasible method in several of the stream reaches due to depth and width variables.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

☒Yes -No

How?

Project addresses several CALFED and CVPIA priorities; Multi-regional #1 and #6 (non-native invasive species, at risk species) Sacramento region #3,5,7 (adaptive management of natural and modified flows, non-native species, conceptual models and restoration performance measures) San Joaquin region #4, #6 (at risk species, natural and modified flow regimes effects on ecosystem functions) Strategic goals #1,2,4,5 (at risk species, ecosystem processes and biotic communities, habitats, and non-native species) Numerous science goals and coordination with CVPIA goals to monitor habitat quality.

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

☒Yes -No

How?

When the proposed project is completed and the IBI (Index of Biotic Integrity) generated, said index can be used to assess the benefits of restoration projects. Data collected during monitoring can be applied to habitat and stream quality data as well as species distribution.

4. Does the project adequately involve local people and institutions?

-Yes XNo

How?

Proposal is primarily research driven, minimal interaction with local landowners (access issues), governments, and stakeholder groups. Interactions with local people and institutions would occur at forums and workshops.

Other Comments:

Strong concerns over electroshocking and the training of all personnel that would be involved with electroshocking. Granting of ESA section 7 concurrence and incidental take permits under section 10 may be very problematic. Short term of the study (3 years) may not give the applicant sufficient data on flows and effects on species diversity.

Sacramento Regional Review:

Proposal Number: 241

Applicant Organization: US Geological Survey

Proposal Title: Monitoring and Assessment of Native and Non-native Resident Stream Fishes in the Sacramento-San Joaquin Watershed

Overall Ranking: ☒Low ☐Medium ☐High

Provide a brief summary explanation of the committee's ranking:

The panel felt this is an important project but rated it low since we felt it was not well coordinated and perhaps too large scale. See additional comments below.

1. Is the project feasible based on local constraints?

☐Yes ☒No

How?

Proponents have not adequately coordinated or communicated with local entities, agencies, or permitting authorities. Proposal is needed, perhaps at a much smaller scale with significantly more upfront attention to identifying and addressing all local issues.

Furthermore, the project described is a survey as opposed to a monitoring study. Sampling once a year for two years is too infrequent to monitor fish populations adequately. Proponents will need to apply for incidental take permits for salmonids and splittail. The prospects for developing an index of biotic integrity is uncertain because it is not clear if the 70 sampling sites, though large in number, would cover spectrum of conditions necessary for an IBI. Furthermore, project description is vague. Perhaps include specifications of particular indicator species of fish to monitor

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

☒Yes ☐No

How?

Proposal most directly addresses PSP Restoration Priorities for the Sacramento Region #7, "Develop conceptual models to support restoration of river, stream and riparian habitat." Focus on assessment of all fish species (native and non-native) is essential to the implementation of restoration actions and management activities that provide the broadest possible benefit; also to ensure that actions taken to benefit one species do not detrimentally affect another.

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

-Yes XNo

How?

The project does not incorporate other studies. Plans to collect information useful to others. Project proponents seemed to spend little time investigating or linking proposal with existing activities. Seemed heavily weighted toward previous research projects associated with academia, but little connection to resource agency or other local efforts. Proposal should, and could have been, locally coordinated if proponents had started with a smaller scale (1-2 streams). This type of project is critical to current and ongoing restoration efforts, but is somewhat representative of an academic approach that fails to adequately incorporate local issues and efforts. This local connection is now widely recognized as essential to implementation and long-term effectiveness of restoration efforts.

4. Does the project adequately involve local people and institutions?

-Yes XNo

How?

Project proponents did not adequately address or contact local people and institutions including agencies with permitting authority.

Other Comments:

This is an important project but was poorly planned. Proponents have demonstrated ability to accomplish such projects and should be encouraged to develop another such proposal that adequately coordinates and integrates with local efforts and agency responsibilities. Additionally, proponents might scale back the proposal to 1-2 representative streams, and increase the time frame to 4-5 years.

External Scientific: #1

Research and Restoration External Scientific Review Form

Proposal Number: **241**

Applicant Organization: **US Geological Survey**

Proposal Title: **Monitoring and Assessment of Native and Non-native Resident Stream Fishes in the Sacramento-San Joaquin Watershed**

Conflict of Interest Statements:

I have no financial interest in this proposal.

XCorrect

-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

None

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;

Good: quality but some deficiencies;

Poor: serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
X Excellent	I consider this a worthy proposal, even with a slight downgrade for performance measures and costs. The performance measures can be addressed in a refinement of the scope of work, and the costs can be negotiated or discussed in more detail. I give this proposal an excellent rating for funding.
-Good	
-Poor	

1. **Goals.** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

Rating: Excellent. The 4 hypotheses are extremely relevant to establishing an effective monitoring framework that can be used to assess restoration goals California aquatic ecosystems. The applicants have addressed the CALFED Science goals with this project.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

Rating: Excellent. The applicants cite numerous papers and studies to support their proposed approach, and outline their hypotheses with associated rationale. An effective ecological monitoring approach is needed to ensure that restoration efforts are effective in restoring ecological integrity. The applicants propose such an approach.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

Rating: Excellent. This 3-year program includes 2 sampling events to ensure results are repeatable, the approach is scientifically valid. The approach is well organized and appears to be an effective way to address the 4 hypotheses, both from a sampling strategy and analytical process. Multiple gear types are proposed. The applicants should describe how the data from the different methods will be integrated.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

Rating: Excellent. All aspects of this project are feasible, with the possible exception of hypothesis 3 as pointed out by the applicants. Regardless, this project will add to the database that will ultimately be required to address discrimination between effects from natural hydrological variability and human-induced factors.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

Rating: Good. The description of the performance measures is deficient. Identifying reports and a peer-reviewed article are not adequate as to what will be reported in the documentation. Performance measures for this project are determination of method suitability, sampling success, adherence to QA/QC, metric calibration and validation, etc.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

Rating: Excellent. Producing at least one peer-reviewed article is a validation by the scientific community on the value of this project. The number of reports appear adequate. The applicants have agreed to participate in public outreach forums, which will be important for CALFED and other stakeholders.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Rating: Excellent. Very strong credentials of the applicants, and a good track record of similar projects in California, all suggest the highest capabilities for this project.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

Rating: Very Good. The budget request appears to be somewhat on the high side. However, this could be due to the request for new equipment that is apparently not available from previous projects. The labor request includes an almost fulltime position for a USGS biologist and a CSUS graduate student.

Miscellaneous comments:

The collaboration between USGS and CSUS is a strong feature of this proposal. The applicants also have done a thorough job of citing the pertinent papers that lend credibility to their proposed project. Applicability to CALFED ERP goals and CVPIA priorities are very well addressed.

External Scientific: #2

Research and Restoration External Scientific Review Form

Proposal Number: **241**

Applicant Organization: **US Geological Survey**

Proposal Title: **Monitoring and Assessment of Native and Non-native Resident Stream Fishes in the Sacramento-San Joaquin Watershed**

Conflict of Interest Statements:

I have no financial interest in this proposal.

XCorrect

-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;

Good: quality but some deficiencies;

Poor: serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Excellent	The project has potential to make a substantial contribution to the larger goals of CalFed and could have later import in evaluating other than anadromous fish responses to restoration. There needs to be modification of the objectives and use of a second year of work and/or a scaling back of that work.
X Good	
-Poor	

1. **Goals.** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

The broad goal (development of condition status of resident fishes) of the project is appropriate and important to the overall CalFed program. Two of the hypotheses (#1 and #4) are fairly trivial and are known already. However, the major hypotheses of applying sampling and IBI measures to see if resident fish communities can reveal existing differences in habitat, water quality, and flow conditions are key.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

The proposal lays a solid framework of previous research and knowledge in the region for the need of this work. The justification for the second year sampling of stations is weak and may not provide much additional information for the cost and effort required. It is not clear how this data would meet the objective of evaluation of flow.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

The proponents have a good description of the methods and reasons for most of the approach. The value (or perhaps just the way it was explained) of a second year of repeat sampling is questionable. However, rephrasing (rethinking) what could be obtained from a repeat of sampling could improve the analysis. One might consider it a reasonable hypothesis that streams with more disturbance (presumably more non-native fish, lower IBI scores, etc.) would as a general condition have more year-to-year variability in IBI or other biologic metrics. This variability would be expressed perhaps regardless of differences in flow between years. Use of a single repeat year of course would be at the mercy of the extent of differences as noted. But 2 years in a row will more than likely only suggest many possibilities for differences. For these reasons, a program of repeat sampling such as proposed will provide little explanatory clarification. The basic structure of the project is the "extensive post-project substitution of space for time." The second year data then could almost be considered a "new" study to see if the same conclusions about the relationships of associations among variables is obtained. For this objective, however, a smaller set of streams (selected to emphasize the range of conditions) would be suitable to examine this question. The project has also been vague in terms of what flow variables it will examine to see how flow may "explain" community composition. Given that USGS gage records are available from all proposed streams, there should have been some notion of what was important to use as a variable. For example, would it be possible to construct any kind of index to a natural flow regime? How are "flow conditions" to be measured in any statistical framework? Use of multivariate methods has advanced and their use has become more routine as programs and methods have become more available. Their use, however, has been predominantly hypothesis generating rather than hypothesis testing and this project gave little clarification on how results would differentiate between these approaches.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

The investigators have extensive experience in conducting such studies and they are familiar with previous work and the conditions of the study areas. The use of two teams raises the possibility of bias and should be considered in training and (better) in allocating effort by a stratified random selection of study streams. The scale of project may not be appropriate in terms of the second year resampling of all stations for the reasons stated above. Some replication for examination of repeatability of conclusions is feasible and appropriate.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

The proposal has not developed much information that would show how it would evaluate whether the protocols developed during this project should be judged as "standard." One must conclude that if they were able to use the methods so selected and found associations among the

variables, then the protocol can be considered standard. Alternatively, if this is a serious attempt to develop standard protocols, then one would assume that there would be effort devoted, for example, to comparisons between the teams on their ability to achieve similar results on the same streams. More thought and development is required of how the project would demonstrate the robustness of the various methods before simple application is considered equivalent to proof of a standard. Such an emphasis could again be justification for a reorganization of time and effort in the second year rather than what has been proposed.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

The project has a good prospect for developing baseline information on resident fish species, stream conditions and associations among habitat variables. Such data may become especially important as another measure of restoration as proposed changes occur in some basins. Reorganization of effort is suggested as a way to make better use of any second year of sampling.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

The investigators have demonstrated their ability to conduct these kinds of investigations.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

The only issue is the relative benefit of the proposed second year of sampling. The likely result of the work as proposed would be modest for relatively high cost. Suggested reorganization of the work or substantial reduction of effort to a subset of streams (as described above) would make the benefits more in line with the cost of this project.

Miscellaneous comments:

The basic idea of developing information on resident species as response variables to eventual restoration is important.

External Scientific: #3

Research and Restoration External Scientific Review Form

Proposal Number: **241**

Applicant Organization: **US Geological Survey**

Proposal Title: **Monitoring and Assessment of Native and Non-native Resident Stream Fishes in the Sacramento-San Joaquin Watershed**

Conflict of Interest Statements:

I have no financial interest in this proposal.

XCorrect

-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

None

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;

Good: quality but some deficiencies;

Poor: serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Excellent	Sampling design is inadequate to meet the primary objective of this project (development of a standardized monitoring program). The cost is roughly 5-fold to high for the number of sites that will be sampled. This project does too little for much too much.
-Good	
XPoor	

1. **Goals.** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

None

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

This study is well justified, a focus on resident fish may provide a more sensitive index of the effects of altered flow regimes caused by impoundment and water withdrawal.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

The main objective of this project is to develop a standardized monitoring program, and the approach fails completely in this regard. I consider this a fatal flaw. My rationale: Sampling once/year may not provide a representative picture of fish community structure. Wouldn't it be better to sample along a seasonal gradient, determine the effects of season on IBI, and then select a representative period (or periods)? Spatial variation in fish community structure is not thought out clearly by the PI. The number of sample sites is insufficient to capture within-stream variation in community structure. Alteration of flow regimes from impoundment and withdrawal occurs at the stream-scale. In addition, the effects of water management will decrease as the distance from the impoundment/withdrawal location increases (serial discontinuity concept). Thus it is very important to capture the within-stream variation in the IBI. Three samples per stream, the approximate number that will be sampled given 70 sites and ca. 20 streams, is completely inadequate to capture this variation. The proposed work makes no attempt to synthesize existing data on fish community structure. Surely there must be considerable data available in CDFG archives that could be used to increase our understanding of regional, seasonal, and within-stream variation in fish community structure. This would be very useful to determine the scope of the initial monitoring program. Considering the high cost of the proposed project, this is unacceptable. There is no reference to the extensive literature on design of fish sampling programs and fish community-habitat relationships. Yet the objectives of this project are to develop a standardized monitoring program ; Fatal flaw #3.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

For the excessive budget, there is no doubt that the proponents will be able to sample 70 sites, as long as all permits can be obtained.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

To meet the projects objectives of designing a standardized monitoring program, the proposed PM's are completely inadequate. The required measure is a picture of the seasonal and spatial variation in fish community structure, and the proposed sampling design will not achieve this.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

Data from 70 fish sampling sites sampled once per year is better than no data at all. Interpretive outcomes regarding seasonal, interannual, and spatial variation (within stream) will not be achieved based on the sampling design.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Based on the proposed sampling design and analysis, I do not consider the applicant to have an adequate statistical background (with a knowledge of components of variance) to develop a standardized and effective monitoring program.

8. Cost/Benefit Comments. Is the budget reasonable and adequate for the work proposed?

\$1.2 million to sample 70 sites is extremely high and is considered a fatal flaw by this reviewer.

Miscellaneous comments:

A sample of very relevant literature not cited by the applicant.

Aadland, L. P. 1993. Stream habitat types: their fish assemblages and relationship to flow. N. Amer. J. Fish. Man. 13: 790-806. Amiro, P. G. 1990. Variation in juvenile Atlantic salmon population densities between consecutive enclosed sections of streams. In I. G. Cowx, ed. Developments in electric fishing. Blackwell Scientific Publications Ltd., Cambridge, MA. Armour, C. L., K. P. Burnham, and W. S. Platts. 1983. Field methods and statistical analyses for monitoring small salmonid streams. U. S. Fish Wildl. Serv. Bohlin, T. 1990. Estimation of population parameters using electric fishing: aspects of the sampling design with emphasis on salmonids in streams. In I. G. Cowx, ed. Developments in Electric Fishing. Blackwell Scientific Publications Ltd., Cambridge, MA. Bohlin, T., C. Dellefors, and U. Faremo. 1982. Electro-fishing for salmonids in small streams: aspects of the sampling design. Rep. Inst. Freshwater Res. Drottningholm 60: 15-18. Cederholm, C. J., and W. J. Scarlett. 1981. Seasonal immigrations of juvenile salmonids into four small tributaries of the Clearwater River, Washington, 1977-1981. Pages 98-110 In E. L. B. a. E. O. Salo, ed. Salmon and trout migratory behaviour symposium. Fraser, D. F., and T. E. Sise. 1980. Observations of stream minnows in a patchy environment: a test of a theory of habitat distribution. Ecology 61: 790-797. Gillis, D. M., and D. L. Kramer. 1987. Ideal interference distributions: population density and patch use by zebrafish. Anim. Behav. 35: 1875-1882. Hankin, D. G. 1984. Multistage sampling designs in fisheries research: applications in small streams. Can. J. Fish. Aquat. Sci. 41: 1575-1591. Hankin, D. G. 1986. Sampling designs for estimating the total number of fish in streams. U. S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, OR. Hankin, D. G., and G. H. Reeves. 1988. Estimating total fish abundance and total habitat area in small streams based on visual estimation methods. Can. J. Fish. Aquat. Sci. 45: 834-844. Hillman, T. W., J. W. Mullan, and J. S. Griffith. 1992. Accuracy of underwater counts of juvenile chinook salmon, coho salmon and steelhead. N. Amer. J. Fish. Man. : 598-603. Milner, N. J., R. J. Wyatt, and M. D. Scott. 1993. Variability in the distribution and abundance of stream salmonids, and the associated use of habitat models. J. Fish Biol. 43: 103-119. Paller, M. H. 1995. Interreplicate variance and statistical power of electrofishing data from low gradient streams in the southeastern United States. N. Amer. J. Fish. Man. 15: 542-550. Roper, B. B., D. L. Scarnecchia, and T. J. LaMarr. 1997. Summer distribution of and habitat use by chinook salmon and steelhead within a major basin of the South Umpqua River, Oregon. Trans. Am. Fish. Soc. 123: 298-308. Slaney, P. A., and A. D. Martin. 1987. Accuracy of underwater census of trout populations in a large stream in British Columbia. N. Amer. J. Fish. Man. 7: 117-122. Thurow, R. F. 1994. Underwater methods for study of salmonids in the intermountain west. U.S. Department of Agriculture, Forest Service, Intermountain Research Station, Ogden, UT. Underwood, A. J. 1993. The mechanics of spatially replicated sampling programmes to detect environmental impacts in a variable world. Aust. J. Ecol. 18: 99-116.

External Scientific: #4

Research and Restoration External Scientific Review Form

Proposal Number: **241**

Applicant Organization: **US Geological Survey**

Proposal Title: **Monitoring and Assessment of Native and Non-native Resident Stream Fishes in the Sacramento-San Joaquin Watershed**

Conflict of Interest Statements:

I have no financial interest in this proposal.

XCorrect

-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;

Good: quality but some deficiencies;

Poor: serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Excellent	The project should produce a lot of information on the stream communities, and provide baseline data from many streams for which data are presently lacking. However, I'm bothered by the lack of detail regarding data collection and data analysis; this makes the project difficult to evaluate. Most of the focus of this project should be on Objectives 1 and 4, since much information already exists relative to Objectives 2 and 3. The specific approaches to reaching these objectives need to be clarified.
XGood	
-Poor	

1. **Goals.** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

All OK. The four objectives, expressed as hypotheses, are consistent with the stated goal of the project. The concept is relevant and important. Use of IBI's in stream monitoring is becoming a widely used methodology in the U.S.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project

justified?

Yes, more knowledge is needed on stream monitoring methodology in the Central Valley. Good justification is provided for the need to use resident species in stream monitoring. The study seems appropriate as a demonstration project. My concerns: 1) the conceptual model assumes that spring flow conditions are the only determinant of composition of fish communities in streams, an over-simplification; and 2) There is already considerable knowledge with regard to Objective no. 2, as a result of many of the studies listed under Literature Cited.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

These questions are difficult to answer, as the authors are vague about how the objectives will be reached. My major concerns here: 1) The lack of experimental control: there is no control or knowledge of what the flows will be in the streams in the next 2 years; what if there is little variation in flow pattern between the 2 years? 2) Community response time: the authors seem to assume that a fish assemblage reponds immediately and fully to a change in flow; but the fish community can't be expected to fully adjust to a change in flow in a short period of time, especially if long-lived fishes are present. 3) Sampling Protocol: Objectives 2,3 & 4 depend on Objective 1, which is development of an effective monitoring protocol. No explanation is given regarding how they will determine if the samples obtained are truly representative of the community. What stream length is required? Number of sampling replications? How will they combine sampling data from different gear types to come up with a composite of fish sp. composition and relative abundance? 4) No explanation is given as to how the IBI will be developed. What criteria will be applied to determine if the IBI turns out to be "useful" or non-useful? Unless these deficiencies are corrected, the usefulness of the project may be of limited value

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

Documentation is adequate. The project may not be technically feasible, because: 1) two visits per site a year apart are not enough to draw conclusions; Jim Karr has stated that long-term sampling is needed to define the range of sampling variation in the IBI. 2) habitat assessment will be done only at the time of sampling, but the fish are subjected to habitat conditions year-round. What about unexpected perturbations that might occur at other times of year? 3) The number of study sites seems excessive; I would recommend a more intensive study for a longer period of time on around 20 study sites.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

No-- there is no indication as to how the success of the project will be evaluated. No criteria are presented that will be used to measure attainment of objectives.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

More information on Central Valley streams and their fish assemblages would be useful. Managers should benefit from the development of a valid monitoring protocol.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Very Good: the investigators are well qualified to undertake the project, and seem to access to all the necessary field equipment that this project requires.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

The cost estimates seem reasonable, but due to the deficiencies I have already noted, I am not sure that the benefits will fully justify the costs (unless the deficiencies are corrected).

Miscellaneous comments:

The authors are not clear on how they will deal with the matter of young-of-year (YOY) fish. Will their sampling gear be adequate to fully sample YOY? Since YOY become more susceptible to standard sampling gear as they grow, isn't it possible that at sites sampled earlier in the summer YOY will be likely to be missed? Also, if some species spawn earlier than others, a biased picture of species abundance could result. Too much reliance on reproductive success in one spring-summer season may be a problem; the condition in the stream during the YOY's first winter may determine how well these fish are recruited into the adult stock.

Environmental Compliance:

Proposal Number: 241

Applicant Organization: US Geological Survey

Proposal Title: Monitoring and Assessment of Native and Non-native Resident Stream Fishes in the Sacramento-San Joaquin Watershed

1. Are the legal or regulatory issues that affect the proposal identified adequately in the proposal?

-Yes **X**No

If no, please explain:

CESA, FESA compliance, and CEQA and NEPA documentation required; Scientific collecting permit required;

State Lands Commission land use lease and Reclamation Board approval may be required.

2. Does the project's timeline and budget reflect adequate planning to address legal and regulatory issues that affect the proposal?

XYes -No

If no, please explain:

If funding and scheduling for environmental compliance is allocated under Project Management.

3. Do the legal and regulatory issues that affect the proposal significantly impair the project's feasibility?

-Yes **X**No

If yes, please explain:

Other Comments:

Budget:

Proposal Number: 241

Applicant Organization: US Geological Survey

Proposal Title: Monitoring and Assessment of Native and Non-native Resident Stream Fishes in the Sacramento-San Joaquin Watershed

1. Does the proposal include a detailed budget for each year of requested support?

☒Yes ☐No

If no, please explain:

2. Does the proposal include a detailed budget for each task identified?

☒Yes ☐No

If no, please explain:

3. Does the proposal clearly state the type of expenses encompassed in indirect rates or overhead costs?

☐Yes ☒No

If no, please explain:

Budget Justification describes indirect rates for USGS and CSUS as "included" but does not specify where they are included/calculated.

4. Are appropriate project management costs clearly identified?

☒Yes ☐No

If no, please explain:

5. Do the total funds requested (Form I, Question 17A) equal the combined total annual costs in the budget summary?

☐Yes ☒No

If no, please explain (for example, are costs to be reimbursed by cost share funds included in the budget summary).

17a State funds: \$1,289,567 Federal funds: \$1,197,823

Budget Summary total: \$1,197,793

According to no. 17 b, c and d: No cost-share funds requested

6. Does the budget justification adequately explain major expenses?

☒Yes -No

If no, please explain:

7. Are there other budget issues that warrant consideration?

-Yes ☒No

If yes, please explain:

Other Comments: